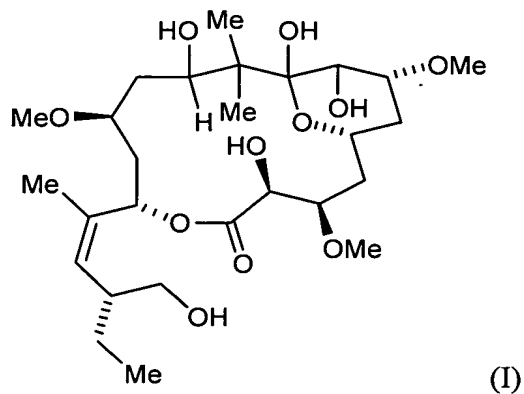


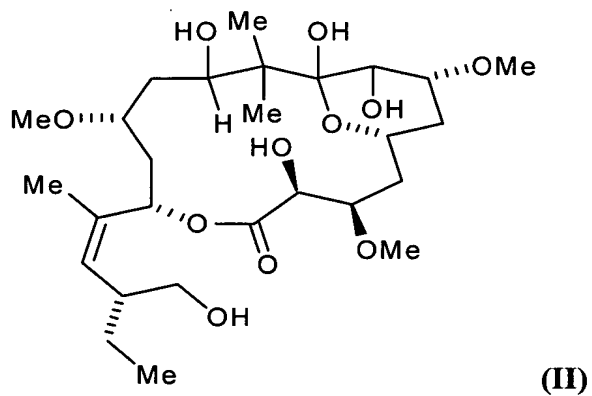
## AMENDMENTS TO THE CLAIMS

This listing replaces all prior versions and listings of claims in the application.

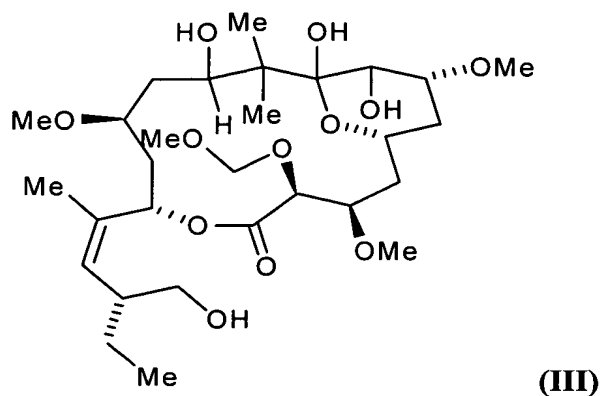
1. (Original) A synthetic compound of formula:



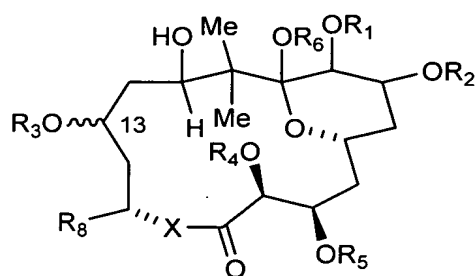
2. (Original) A synthetic compound of formula:



3. (Original) A compound of formula:

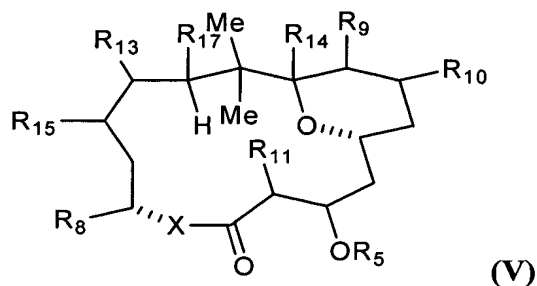


4. (Original) A compound of formula:



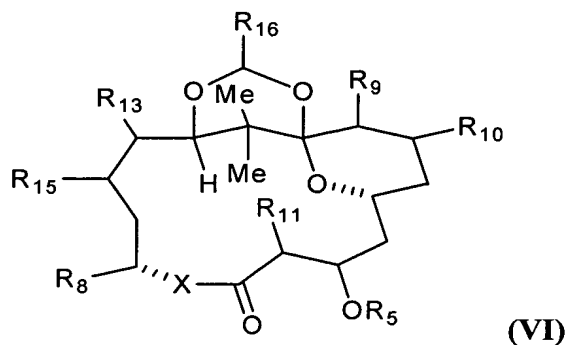
where R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, and R<sub>6</sub> can be the same or different and are selected from the group consisting of H, Me, alkyl, functionalized alkyl, and where R<sub>8</sub> is selected from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

5. (Original) A compound of formula:



where  $R_{13}$  is H or Me, where  $R_{14}$ ,  $R_{17}$  can be the same or different and are selected from the group consisting of H, OH, and OR, where  $R_9$ ,  $R_{10}$ ,  $R_{11}$ ,  $R_{15}$  can be the same or different and are selected from the group consisting of H, Me, and OR, where R and  $R_5$  can be the same or different and are selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where  $R_8$  is selected from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

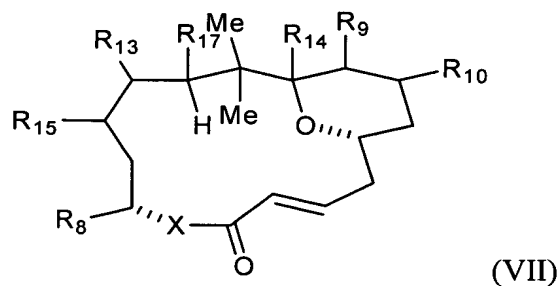
6. (Original) A composition comprising a compound of formula:



where  $R_{13}$  is H or Me, where  $R_9$ ,  $R_{10}$ ,  $R_{11}$ ,  $R_{15}$  can be the same or different and are selected from the group consisting of H, Me, OR, where R and  $R_5$  can be the same or different and are selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where  $R_8$ ,  $R_{16}$  can be the same or different and are selected from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized

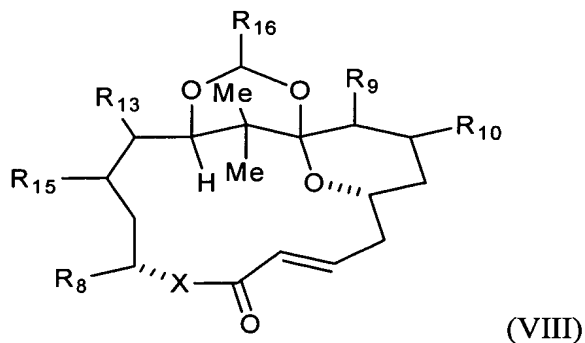
alkynyl, and where X is O or NH and wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

7. (Original) A composition comprising a compound of formula:



where R<sub>13</sub> is H or Me, where R<sub>14</sub>, R<sub>17</sub> can be the same or different and is selected from the group consisting of H, OH, or OR, where R<sub>9</sub>, R<sub>10</sub>, R<sub>15</sub> can be the same or different and are selected from the group consisting of H, Me, OR, where R is selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where R<sub>8</sub> is selected from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

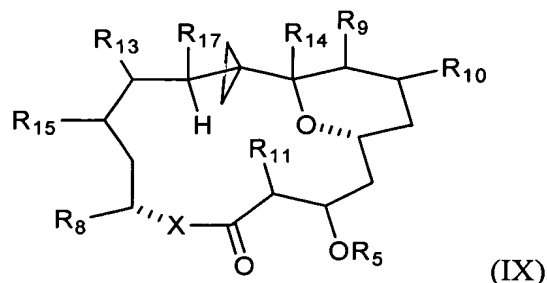
8. (Original) A composition comprising a compound of formula:



where R<sub>13</sub> is H or Me, where R<sub>9</sub>, R<sub>10</sub>, R<sub>15</sub> can be the same or different and are selected from the group consisting of H, Me, OR, where R is selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where R<sub>8</sub>, R<sub>16</sub> can be the same or different and are selected

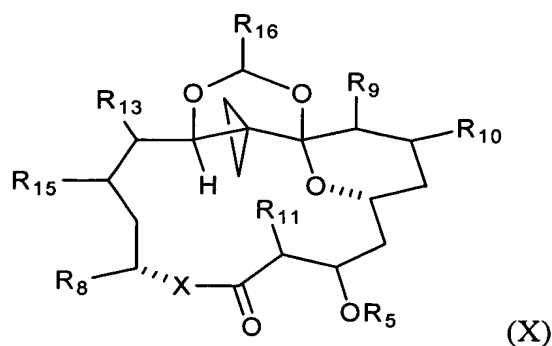
from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

9. (Original) A composition comprising a compound of formula:



where R<sub>13</sub> is H or Me, where R<sub>14</sub>, R<sub>17</sub> can be the same or different and are selected from the group consisting of H, OH, or OR, where R<sub>9</sub>, R<sub>10</sub>, R<sub>11</sub>, R<sub>15</sub> can be the same or different and are selected from the group consisting of H, Me, OR, where R and R<sub>5</sub> can be the same or different and are selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where R<sub>8</sub> is H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

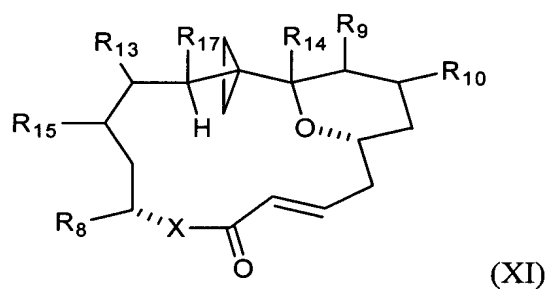
10. (Original) A composition comprising a compound of formula:



where R<sub>13</sub> is H or Me, where R<sub>9</sub>, R<sub>10</sub>, R<sub>11</sub>, R<sub>15</sub> can be the same or different and are selected from the group consisting of H, Me, OR, where R and R<sub>5</sub> can be the same or different and are

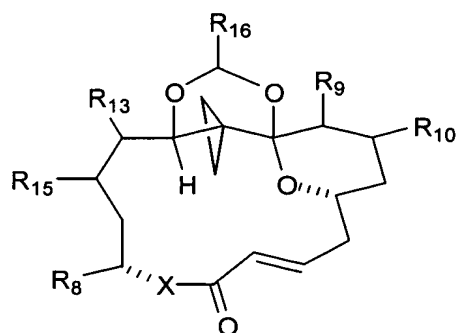
selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where  $R_8$ ,  $R_{16}$  can be the same or different and are selected from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

11. (Original) A composition comprising a compound of formula:



where  $R_{13}$  is H or Me, where  $R_{14}$ ,  $R_{17}$  can be the same or different and are selected from the group consisting of H, OH, or OR, where  $R_9$ ,  $R_{10}$ ,  $R_{15}$  can be the same or different and are selected from the group consisting of H, Me, OR, where R is selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where  $R_8$  is H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

12. (Original) A composition comprising a compound of formula:



(XII)

where R<sub>13</sub> is H or Me, where R<sub>9</sub>, R<sub>10</sub>, R<sub>15</sub> can be the same or different and are selected from the group consisting of H, Me, OR, where R is selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where R<sub>8</sub>, R<sub>16</sub> can be the same or different and are selected from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

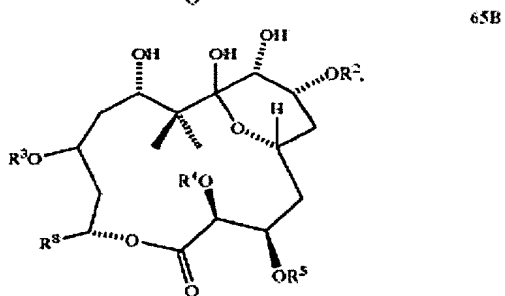
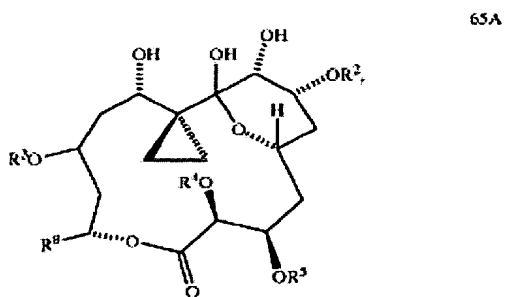
13. (Original) A synthetic compound having the <sup>13</sup>C NMR signature of **FIG. 4** and the <sup>1</sup>H NMR signature of **FIG. 5**, wherein the compound is dextrarotary, and wherein the compound comprises microtubule-stabilizing activity.
14. (Original) A method for treating cancer comprising contacting a tumor cell within a subject with a compound of any one of claims 1 through 13 for a period of time and in an amount sufficient to inhibit growth of the tumor cell.
15. (Original) A method of suppressing growth of a tumor cell comprising contacting said cell with a compound of any one of claims 1 through 13 for a period of time and in an amount sufficient to suppress growth of the tumor cell.
16. (Original) A method of inhibiting growth of proliferating cells comprising the step of administering to the proliferating cells the compound of any one of claims 1

through 13 for a period of time and in an amount sufficient to inhibit proliferation of the cells.

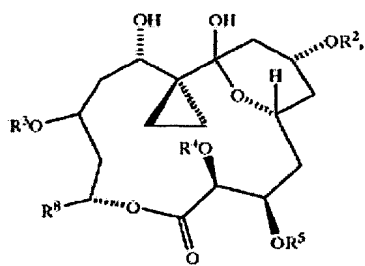
17. (Original) A method of stabilizing microtubule formation in a cell comprising administering to the cell the compound of any one of claims 1 through 13 for a period of time and in an amount sufficient to stabilize microtubule formation.

18-22. (Canceled)

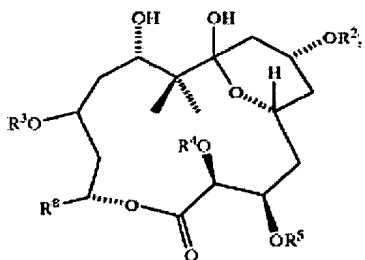
23. (Original) A compound selected from the group consisting of:



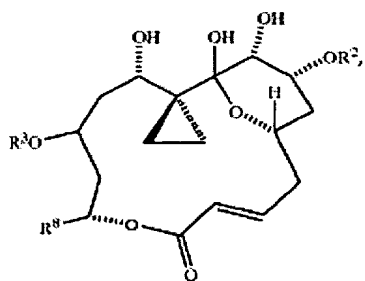




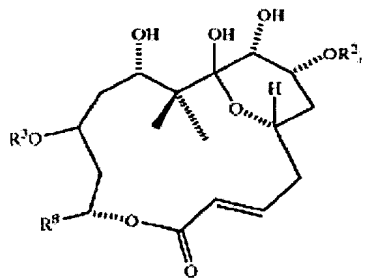
65C



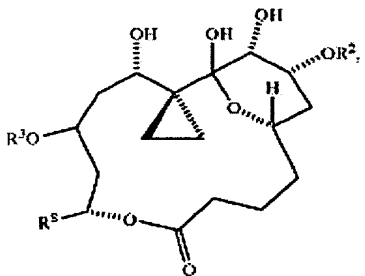
65D



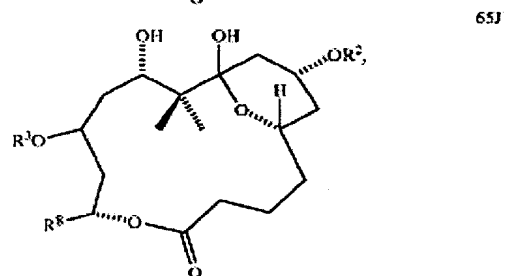
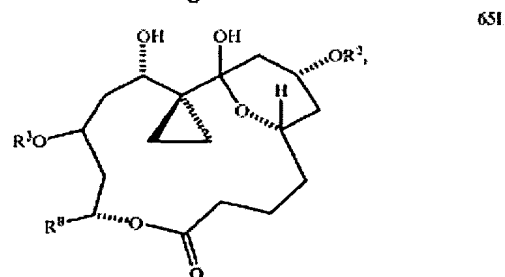
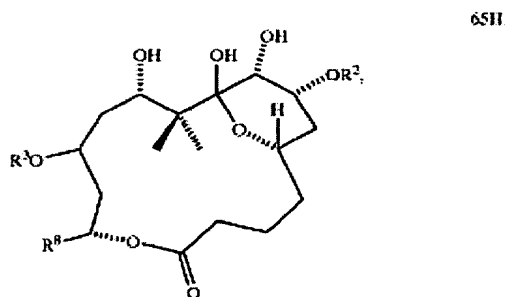
65E



65F



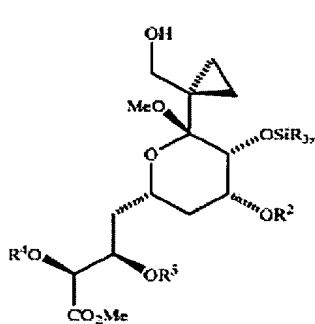
65G



wherein  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$  can be the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, and where  $R^8$  is selected from the group consisting of aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

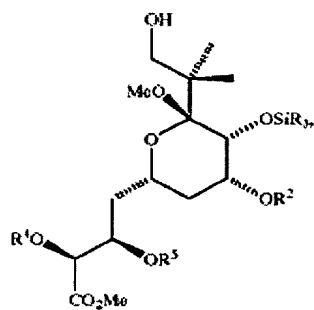
24. (Original) A method of producing Peloruside A comprising:

(a) oxidizing an alcohol function in a compounds selected from the group consisting of:

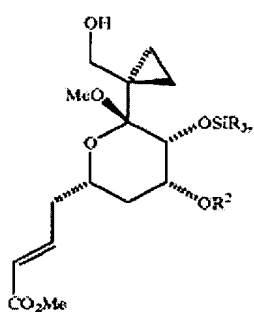


61A

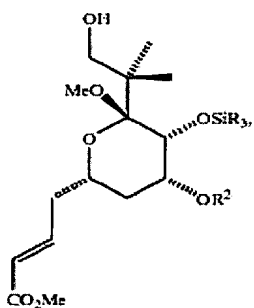
61B



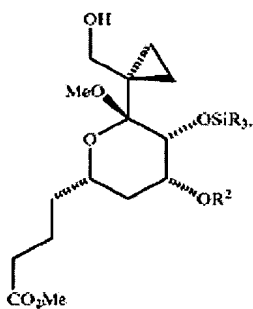
61E



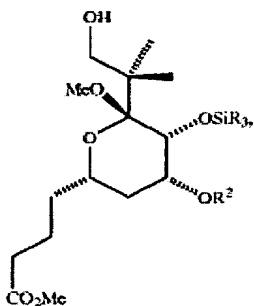
61F



61G



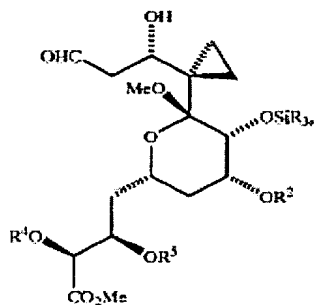
61H



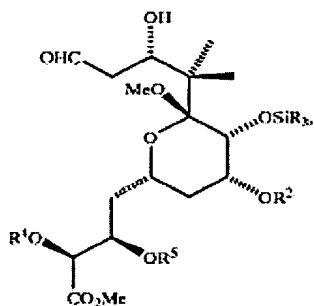
wherein  $R^2$ ,  $R^4$  and  $R^5$  are the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl, to obtain a compound having an aldehyde function;

- (b) reacting the compound obtained in (a) with an allylating agent;
- (c) subjecting the reaction product of (b) to oxidative cleavage of the aldehyde to obtain a compound selected from the group consisting of:

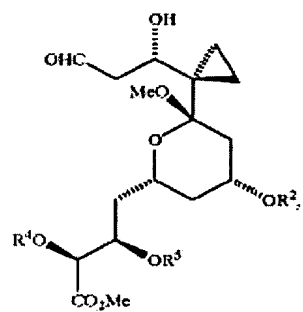
62A



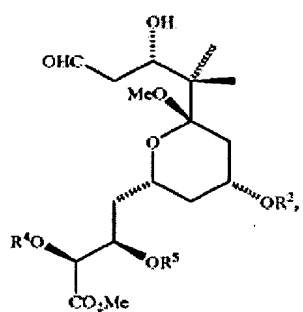
62B



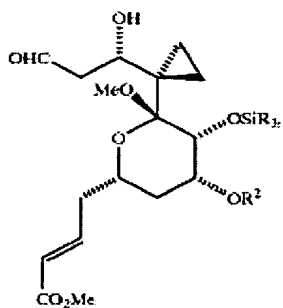
62C



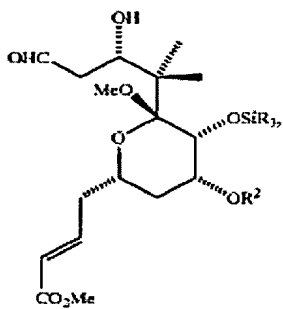
62D

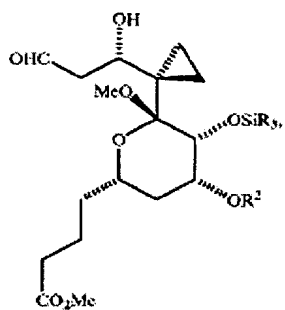


62E

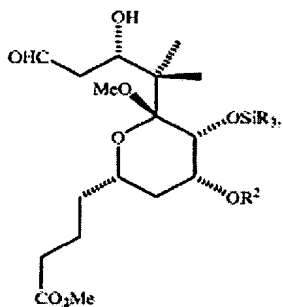


62P

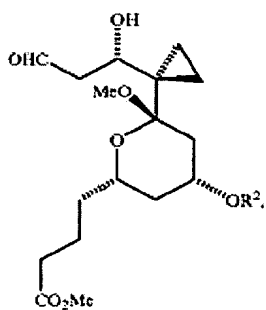




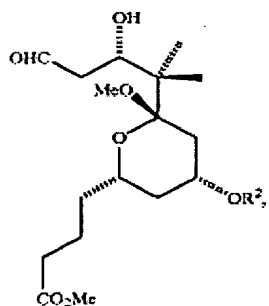
62G



62H



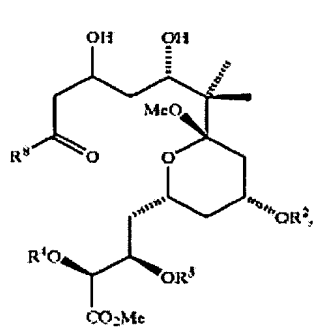
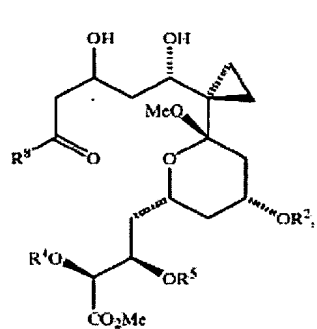
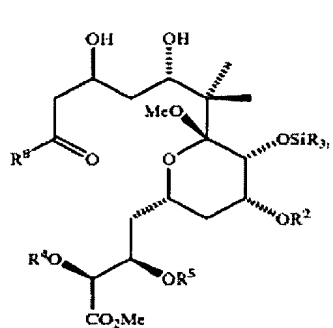
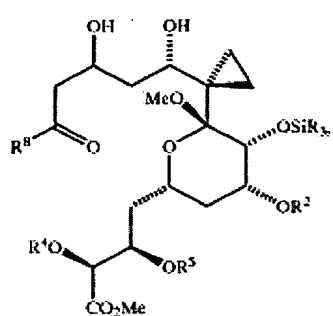
62I



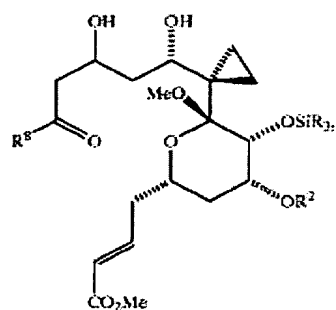
62J

wherein  $R^2$ ,  $R^4$  and  $R^5$  are the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl;

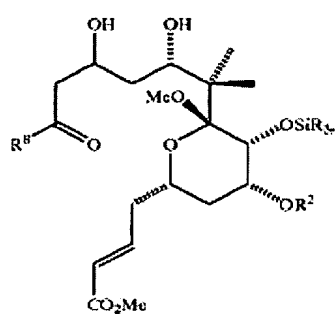
(d) reacting the compound obtained in (c) with an enolate derived from a methyl or ethyl ketone to obtain a compound selected from the group consisting of:



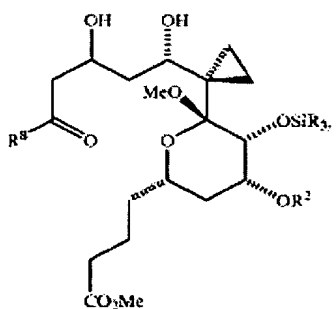




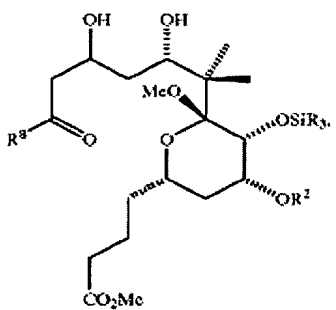
63E



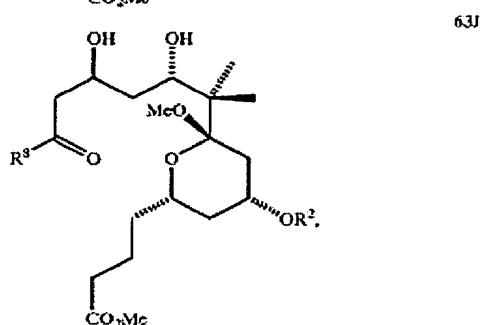
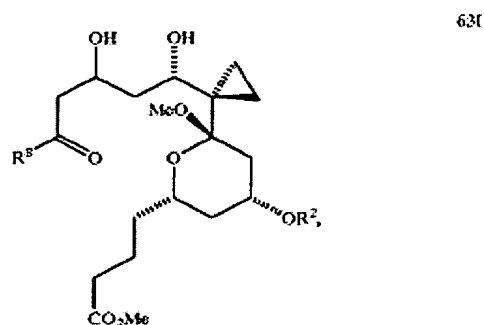
63F



63G

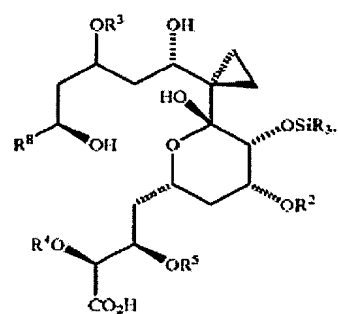


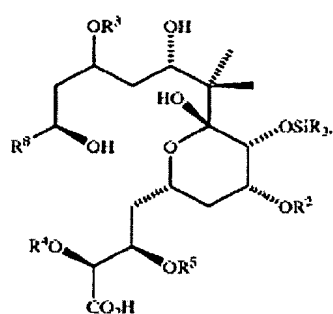
63H



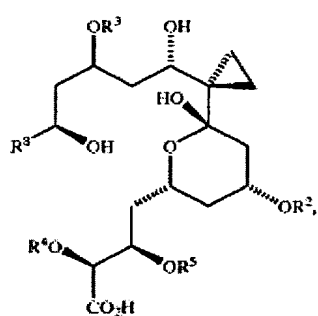
wherein  $R^2$ ,  $R^4$  and  $R^5$  can be the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, and  $R^8$  is selected from the group consisting of aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl;

- (e) reacting the compound obtained in (d) with an alkylating agent to introduce and  $R^3$  group;
- (f) subjecting the compound obtained in (e) with a reducing agent to reduce the ketone group in the compound obtained in (e) to an alcohol;
- (g) converting the alcohol group of the compound obtained in (f) to an ester group;
- (h) subjecting the compound obtained in (g) to an agent that hydrolyzes the ester group of the compound produced in (f) to a carboxylic acid group to obtain a seco-acid compound selected from the group consisting of:

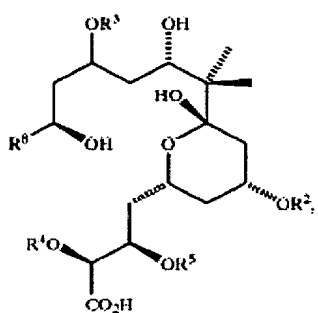




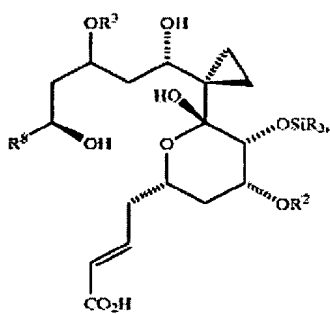
64B



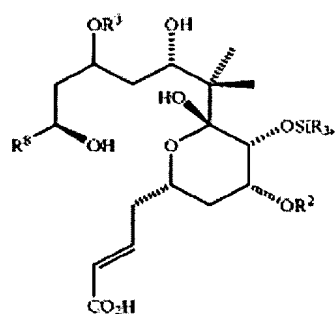
64C



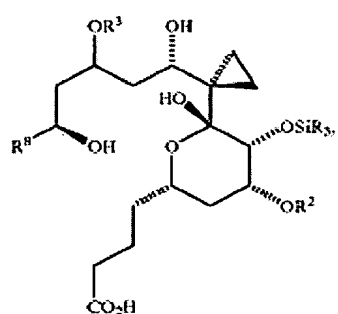
64D



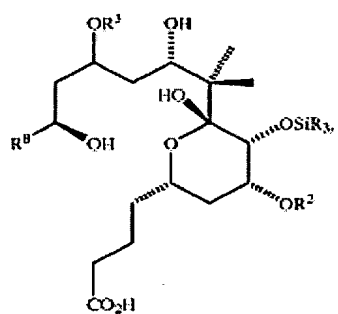
64E



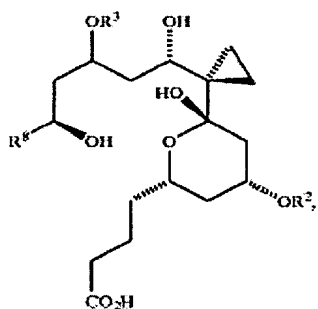
64F



64G

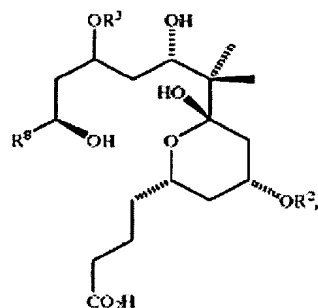


64H



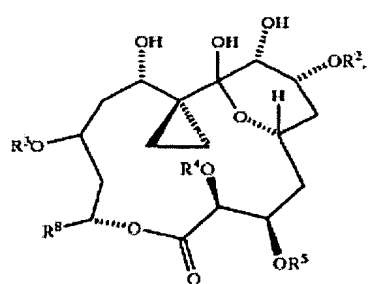
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641

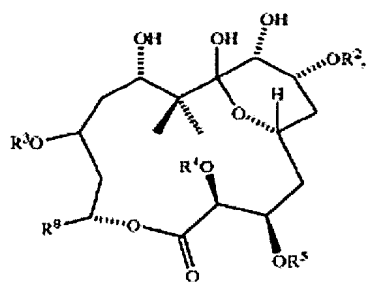


wherein R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup> can be the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, and where R<sup>8</sup> is selected from the group consisting of aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl; and

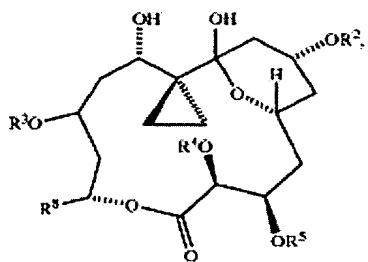
- (i) reacting the carboxylic acid group and a hydroxyl group of the compound produced in (h) to obtain a macrolactone selected from the group consisting of:



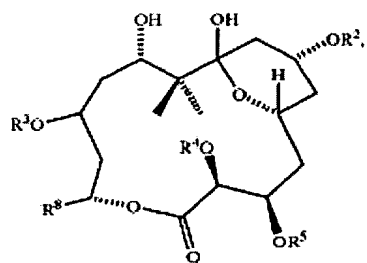
65A



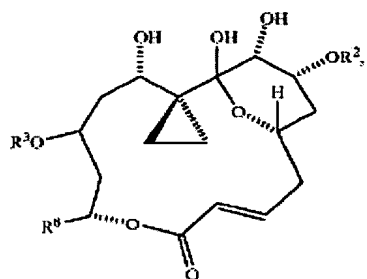
65B



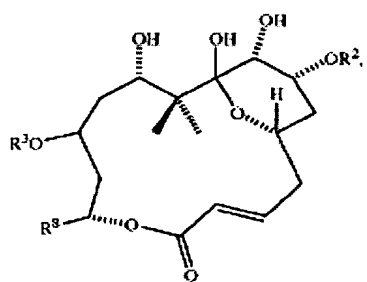
65C



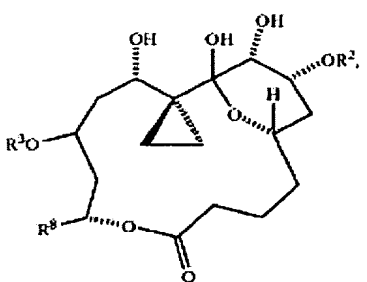
65D



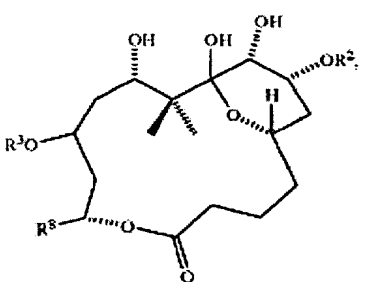
65E



65F

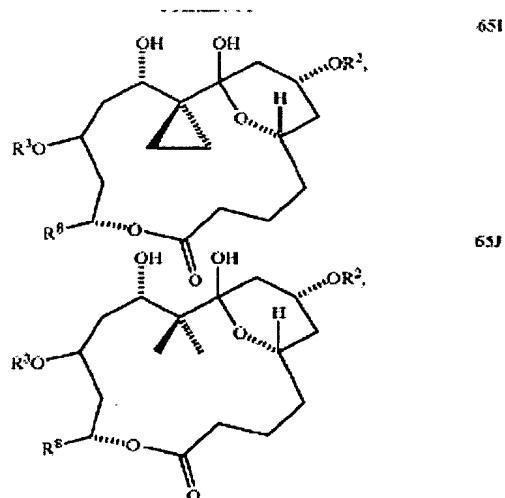


65G



65H

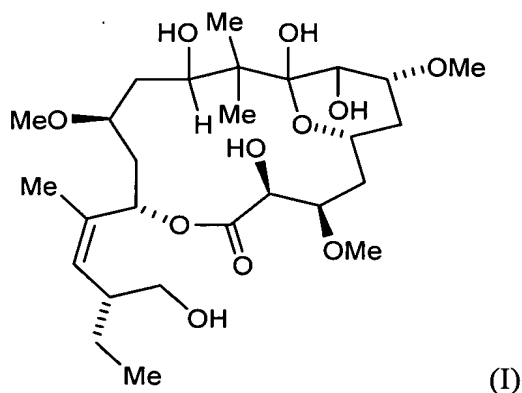




wherein  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$  can be the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, and where  $R^8$  is selected from the group consisting of aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

25. (Original) The method of claim 24 wherein the macrolactone is Peloruside A.

26. (Original) The method of claim 24 wherein the macrolactone has the formula:



27. (Original) The method of claim 24 wherein the macrolactone has the formula:

